442138 8809-38-13

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES

ORIGINAL (Red)

Preliminary Assessment

FOR

STANDARD STEEL
FREEDOM FORGE CORP. - STANDARD DIVISION
PA #547

City of Burnham
Mifflin County
Pennsylvania

STANDARD STEEL
FREEDOM FORGE CORP. - STANDARD DIVISION

PA-547 PAD 009403825

ORIGINAL (Red)

Standard Steel is a speciality steel mill located along the Kishacoquillas Creek in Burnham, Mifflin County. There has been a steel mill operating at that location since 1811.

Standard Steel has undergone numerous ownership and/or name changes in the past 20 years. Up until 1975 Standard Steel was a division of Baldwin-Lima-Hamilton. In 1975 it became jointly owned by NL Industries and Alleghany International and went by the name of "Standard Steel Division of Titanium Metals Corporation of America" (TMCA). In 1982 the name was changed to Standard Steel, an enterprise of Freedom Forge.

Standard has also undergone numerous process changes which would affect their waste stream. Fly ash collectors were first installed in 1953. Electric arc furnaces were first used in 1957. Foundry operations were phased out in 1963. Dust collectors were installed in the melt shops in 1971.

Standard disposed of slag foundry sand, emission control wastes and other waste at 2 captive sites near the plant. There are two main disposal areas designated at the low disposal area and the high disposal area.

The low disposal area is located northwest of the plant in what is now the slow-moving inventory outdoor storage area. As recently as 1975, it was used for the disposal of electric arc furnace emission control dust. There was a lagoon located below the pile for wet emission control sludges. The high disposal area is located to the east of the low area and forms a large "L" around the Birch Hill Cemetery. The two areas are linked by a railroad bed now used as a haul road. The southwestern leg of the "L" is inactive, and is being closed as directed by Pa. DER. Portions of this area are used for steel reclaiming. The active working face is located in the southeastern leg of the L. A permit application for slag disposal has been made for this area. This area was briefly used as a hazardous waste pile for emission control dust--K061. The material was removed and reclaimed in 1982. On several occasions in 1981 and 1982 tankers were observed on the highpile by Pa. DER personnel. Disposal of oi waste and/or solvents is suspected but no actual disposal was observed or documented. Bearoff Brothers operated the high disposal area for Standard Steel and also processed other metal bearing wastes on the site. Some waste from Bearoff's operations remains on the site. A series of monitoring wells was installed around the high disposal area in 1983 as part of the permit application to PA DER for slag disposal. Monitoring results indicated heavy metals and solvents have left the property in the groundwater. A groundwater pollution abatement study is now in progress.

Conclusion

Freedom Forge Corp., Standard Division, PA-547 is officially known as "Standard Steel an Enterprise of Freedom Forge". A short assessment was also done on this site as "Standard Steel Division of Baldwin-Lima" PA 1387.

Conclusion (Cont.)

Emission control dust/sludge K061 has been disposed of on the site, heavy metal bearing sludges have also been left on the site. Illegal disposal of oily and solvent waste is suspected on site. Groundwater contamination has been detected off site but has not reached any water supplies. A groundwater pollution abatement study is underway. A cleanup and closure of the inactive portions of the high disposal area is in progress. A permit has been applied for to PA DER for slag disposal in the active portion of the site. No further site inspection is needed in high disposal area.

The low disposal area has not been studied yet at the time of this assessment. The low area was used for recycling of emission control dust/sludge and for disposal of emission control dust/sludge, slag and other wastes. This area should have a site inspection if one is not done by Standard Steel. PA DER is currently working with Standard Steel to address this problem.

Heavy metal sludges found on the site were presumably left by Bearoff Brothers. A similar waste was left by Bearoff Brothers at Penn Glass Sand, Bratton Township, Mifflin County, PA 1132, PAD 981034861. An assessment was done at the site on 9/1/84 by PA DER. No site inspection has been done to date. I recommend a site inspection is needed at this site also.

* According to PA DER the low disposal area has not been studied at this moment.

ORIGINAL

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

EPA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
PA	0547

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Standard Steel Freedom Forge Corp. Standard Div.	500 N. Walnut St.				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG DIST**
Burnham	PA	17009	MIFFLIN	44	9

09 COORDINATES LATITUDE	LONGITUDE
40 38 45.0	77 33 45.0

10 DIRECTIONS TO SITE (Starting from nearest public road)

Stop at Standard Steel office, 500 N. Walnut St., Burnham for entrance to the site.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)			
Standard Steel	500 N. Walnut Street			
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 TELEPHONE NUMBER**	
Burnham	PA	17009	(717) 248-4911	
07 OPERATOR (If known and different from owner)	**08 STREET (Business, mailing, residential)**			
Same				
09 CITY	**10 STATE**	**11 ZIP CODE**	**12 TELEPHONE NUMBER**	
			( )	

13 TYPE OF OWNERSHIP (Check one)

☒ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL

☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☒ A. RCRA 3001 DATE RECEIVED: 8 / 18 / 80 (MONTH DAY YEAR) ☒ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: 6 / 9 / 81 (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION ☒ YES ☐ NO DATE on going (MONTH DAY YEAR)

BY (Check all that apply) ☐ A. EPA ☐ B. EPA CONTRACTOR ☒ C. STATE ☐ D. OTHER CONTRACTOR ☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)

CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)	03 YEARS OF OPERATION		
☒ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN	1811 (BEGINNING YEAR)	(ENDING YEAR)	☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Solvents, heavy metals, oily wastes, emission control dust K 061

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

Ground water contamination

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form) unless on-going study and clean-up is not completed

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency, Organization)			03 TELEPHONE NUMBER
Jeffrey Stout	PA DER			(814) 946-7292
04 PERSON RESPONSIBLE FOR ASSESSMENT	**05 AGENCY**	**06 ORGANIZATION**	**07 TELEPHONE NUMBER**	**08 DATE**
Jeffrey Stout	PA DER	Waste Management	(814) 946-7292	2 / 18 / 87 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

ORIGINAL (Red)

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
PA	0547

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- X A. SOLID
- X B. POWDER, FINES
- X C. SLUDGE
- [ ] D. OTHER (Specify)
- [ ] E. SLURRY
- X F. LIQUID
- [ ] G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS: Unknown
- CUBIC YARDS: Unknown
- NO. OF DRUMS: N/A

03 WASTE CHARACTERISTICS (Check all that apply)

- X A. TOXIC
- [ ] B. CORROSIVE
- [ ] C. RADIOACTIVE
- [ ] D. PERSISTENT
- [ ] E. SOLUBLE
- [ ] F. INFECTIOUS
- [ ] G. FLAMMABLE
- [ ] H. IGNITABLE
- [ ] I. HIGHLY VOLATILE
- [ ] J. EXPLOSIVE
- [ ] K. REACTIVE
- [ ] L. INCOMPATIBLE
- [ ] M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	Unknown		
OLW	OILY WASTE	Unknown		
SOL	SOLVENTS	Unknown		
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS	Unknown		

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
SLU	Emission Control Sludge	99 K061	Unlined lagoon	Unknown	
OLW	Waste Oil	99	Unpermitted dumping	Unknown	
SOL	1,1 Dichloroethane	74-34-3	found in ground water	82	mg/l
	1,1 Dichloroethylene	75-35-4	found in ground water	27	mg/l
	1,2 Trans Dichlorethylene	75-35-4	found in ground water	460	mg/l
	Trichloroethylene	79-01-6	found in ground water	150	mg/l
MES	Hexarulent Chromium	7440-47-3	found in monitoring well	1.9	mg/l

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

PA DER Files

EPA FORM 2070-12 (7-81)

ORIGINAL (Red)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
PA	0547

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION
02 [X] OBSERVED (DATE: 8-4-86) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 200+
04 NARRATIVE DESCRIPTION

Ground water monitoring shows ground water contamination across the road from the slag pile. Monitoring of home owners in the area wells shows no contamination yet.

01 [ ] B. SURFACE WATER CONTAMINATION
02 [ ] OBSERVED (DATE:) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION

01 [ ] C. CONTAMINATION OF AIR
02 [ ] OBSERVED (DATE:) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION

01 [X] D. FIRE/EXPLOSIVE CONDITIONS
02 [ ] OBSERVED (DATE:) [ ] POTENTIAL [X] ALLEGED
03 POPULATION POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION

Dumping of combustible materials, wood paper, etc., with hot slag resuited in fires on the slag pile.

01 [ ] E. DIRECT CONTACT
02 [ ] OBSERVED (DATE:) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION

01 [X] F. CONTAMINATION OF SOIL
02 [ ] OBSERVED (DATE:) [ ] POTENTIAL [X] ALLEGED
03 AREA POTENTIALLY AFFECTED: 75 (Acres)
04 NARRATIVE DESCRIPTION

The area has been dumped on for over 150 years.

01 [X] G. DRINKING WATER CONTAMINATION
02 [ ] OBSERVED (DATE:) [X] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 200
04 NARRATIVE DESCRIPTION

Homes on private wells are located down gradiant from the site and from detected groundwater contamination.

01 [ ] H. WORKER EXPOSURE/INJURY
02 [ ] OBSERVED (DATE:) [ ] POTENTIAL [ ] ALLEGED
03 WORKERS POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION

01 [ ] I. POPULATION EXPOSURE/INJURY
02 [ ] OBSERVED (DATE:) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION

ORIGINAL (Red)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
PA	0547

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☒ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
Unlined lagoon used for emission control sludges from Electric Arc Production of Steel K 061

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☒ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☒ ALLEGED
04 NARRATIVE DESCRIPTION
Disposal areas not yet permitted.
Tankers observed in the disposal area.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

See narrative

V. SOURCES OF INFORMATION (Cite specific references, e. g., state files, sample analysis, reports)

PA DER Files

FIELD TRIP SUMMARY REPORT

ORIGINAL (Red) ORIGINAL (Red)

This summary should be prepared in conjunction with the Preliminary Assessment, EPA Form 2070-12.

EPA Case Number PA 0547 Site Name Freedom Forge, Standard

Site Description

Low area - app 5 acre waste pile with a 2 acre closed sludge lagoon. High area - app 63 acre of slag piles and other wastes

All wastes are from Iron & steel production.

Area of site (acres) 70 acres	Hazardous portion, if not entire site
63 high area 7 low area	Unknown

Description of processes/operations which took place at the site

Standard steel is a specialty steel producer manufacturing forged rings, railroad wheels and axles and other specialty steel items. The site is the disposal area from this plant.

Waste handling/disposal practices

The low area was used as a dumping area for slag, foundry sand, etc., and was later used for disposal and recycling at Emission control dust and sludge. It is currently used for ingot storage. The high area is a slag disposal dump. Metal is reclaimed from the slag at the site. In the past, the area has been used for demolition waste, foundry sand, milscale, emission control wastes, etc. Non-ferris metal reclaiming was conducted on the site. Past oily waste dumping is suspected.

Site topography and runoff drainage pathways

The high disposal area is a topographic high. Drainage is to Creighton Run and through a bricklined tunnel under the plant to Kishacoquillas Creek.

Surface or subsurface drainage areas (leachate) noted?	Odors/stains noted?
A spring emerges from the old disposal pile in the southeast corner of the high disposal area	No
	Stressed vegetation noted? No

Location and description of streams or receiving waters adjacent to site. Include flow direction and observations. Note location on attached map.

Creighton Run runs along the Northwest boundry of the high disposal area and goes through a brick-lined run under the standard steel plant to Kishacoquillas Creek. There is an intermittent stream along the Northeast boundry which draws to Hungry Run.

Monitoring wells on site or in vicinity. Note location on attached map.

Wells have been established around the high disposal area.

Population within ¼ mile of site:

- ☐ 0-10
- ☐ 10-100
- ☒ greater than 100

Population within 1 mile of site:

- ☐ 0-10
- ☐ 10-100
- ☐ 100-1000
- ☒ greater than 1000

ORIGINAL (Red)

Surrounding land use (woodlot, agricultural, recreation, industrial, etc.)

NORTH	EAST
Scattered residential wooded	Wooded, closed landfill
SOUTH	**WEST**
Residential, industrial	Industrial, residential

Municipal water supply within 3-mile radius (note use of surface water and/or wells)

None

eference:

Domestic wells. Approximate number within ¼ mile: _____
List nearest wells below and show locations on attached map.

Owner/Resident	Address	Phone
(b) (9) [redacted]		

Groundwater flow direction, if known

The major flow is to the east. See attached map for local flows.

Description of odor/taste problems

None

State inspection activity (including permits held)

NPDS
Air Quality
Applying for slag pile permit application No. 300977
RCRA Generator PAD 061106209

State/Federal/Private remedial activities

A groundwater abatement study is being conducted at the high disposal pile by Earth Science consultants as ordered by Pa DER.

Additional comments--Further description of site

See comment sheet

SITE CONTACTS

Name and Title	Affiliation	Phone
Blair Echart	Standard Steel	717-248-4911
Michael P. Bahor	Earth Sciences Consultants, Inc.	412-733-3000

INSPECTION INFORMATION

Name and title of inspector(s) Jeffrey D. Stout, Solid Waste Specialist

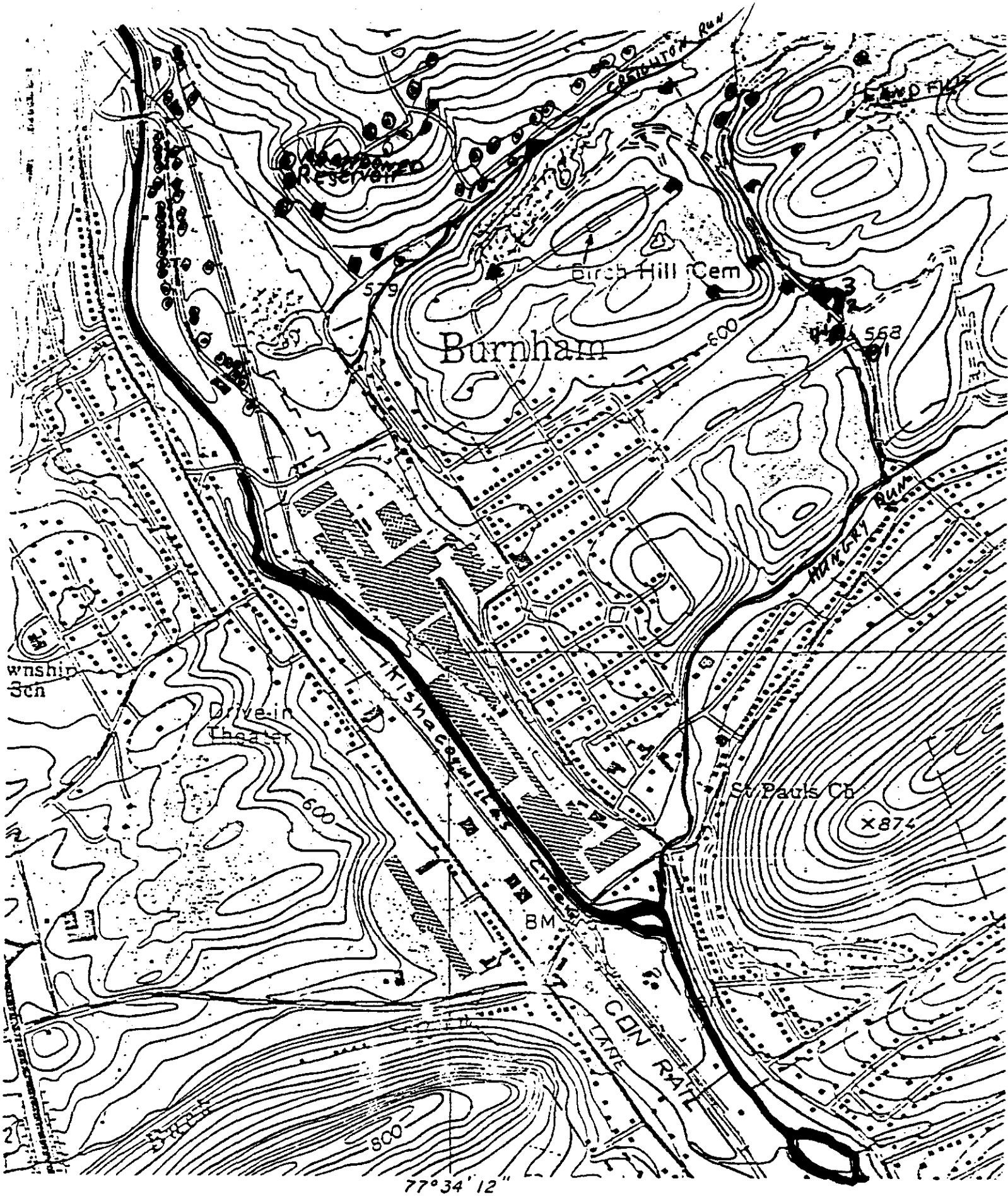
Agency Pa. DER Phone number 814-946-7292

Date on-going Time on site

Weather conditions:

ATTACHMENTS

- o Topographic map identifying site location. Include name of quadrangle m .
- o Site sketch map showing location of monitoring wells, domestic wells, mu cipal water supplies, and areas of concern (lagoons, leachate seeps, drums, et)
- o Any available sampling results or state monitoring data with map showing ample locations.



● Home Well

● Monitoring Well

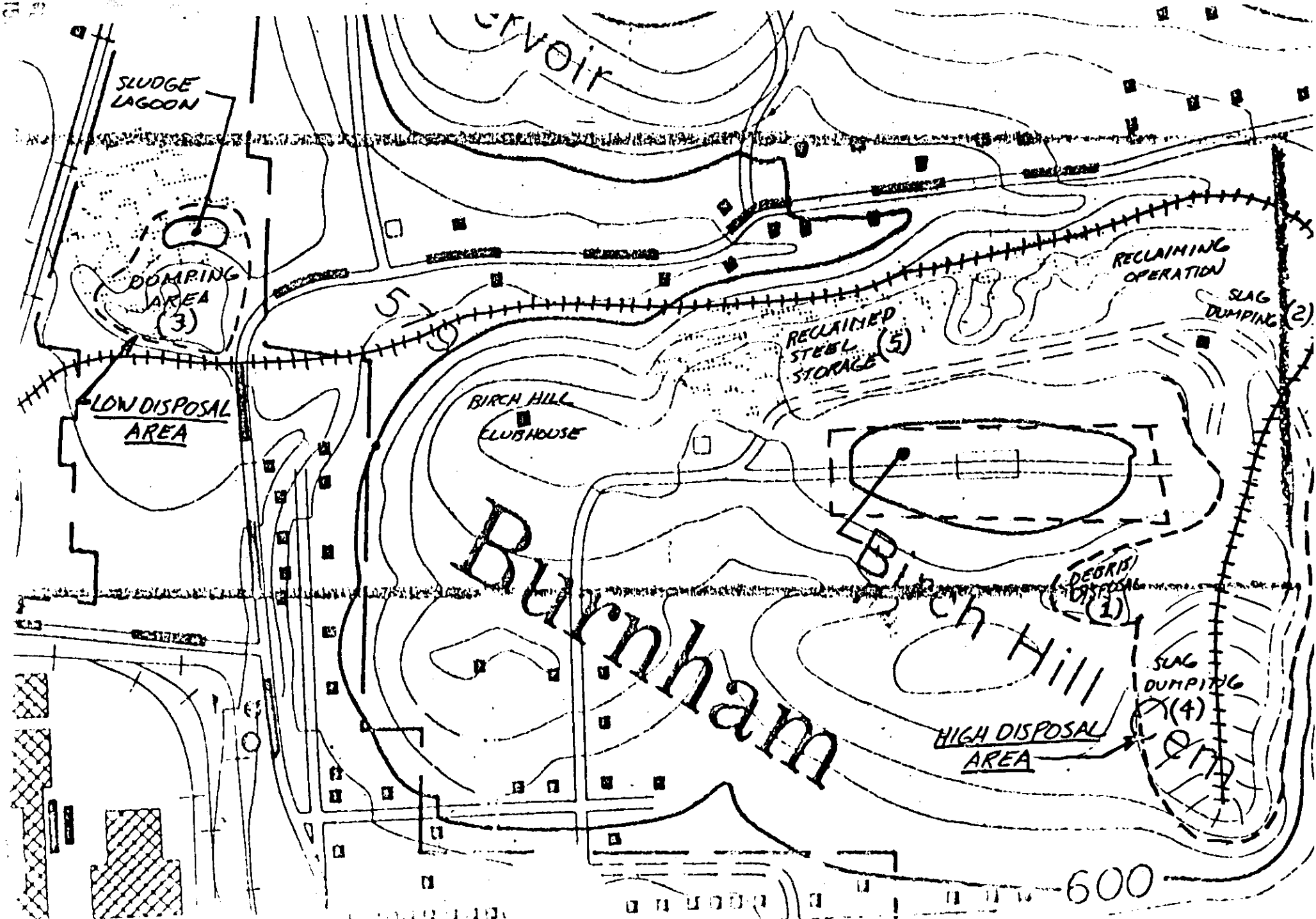
LOCATION MAP

STANDARD STEEL

U.S.G.S. MAP BURNHAM, PA

SCALE 1" = 1000'

1000 0 1000


SLUDGE LAGOON
DUMPING AREA (3)
LOW DISPOSAL AREA
BIRCH HILL CLUBHOUSE
RECLAIMED STEEL STORAGE (5)
RECLAIMING OPERATION
SLAG DUMPING (2)
DEBRIS DISPOSAL (1)
SLAG DUMPING (4)
HIGH DISPOSAL AREA
Burnham
Birch Hill
600

STANDARD STEEL
BURNHAM, PA 17009 (717) 248-4911

April 12, 1982

Environmental Protection Agency
Region III
Box 1480
Philadelphia, PA 19107

Attn: Ms. Shirley Bulkin

Subject: Submittal of Revised Part A of the Hazardous Waste Permit Application for the Burnham Plant of Standard Steel

Dear Ms. Bulkin:

Enclosed herewith is a revised Part A, Forms 1 and 3, Application for a Hazardous Waste Permit for the Burnham plant of Standard Steel. Submittal of a revised application is in order for the reasons discussed below.

Our original application submitted to Region III of the U.S. EPA indicated that electric furnace dust (K061), a hazardous waste generated at the Burnham plant, undergoes type T04 treatment in a pelletizer and the pellets disposed of in a landfill operation (D80). However, since November 19, 1980, the pelletized material was stored in a small segregated area separate from the normal landfill area. Thus, the classification of this operation is changed from D80 to S03.

All of the stored pellets have been removed from the area and shipped to New Jersey Zinc Co. in Palmerton, PA for reclamation. The storage area was "skimmed" approximately six inches below the original grade elevation to ensure complete removal. A subsequent inspection of the facility by the local DER Solid Waste Specialist, Mr. Jeffrey D. Stout, corroborates the complete removal and clean-up.

Our present operation consists of pelletizing the dust from the baghouse and loading directly into trailers for shipment to NJZ for profitable reclaiming. As a physical pre-treatment prior to useful reclamation, the pelletizing operation is exempt from regulations.

Since the pellets are no longer stored on-site, we are submitting the revised applications to inform you of our activities during the period of time between the inception of RCRA and the advent of our present method of direct shipments to a reclaiming operation.

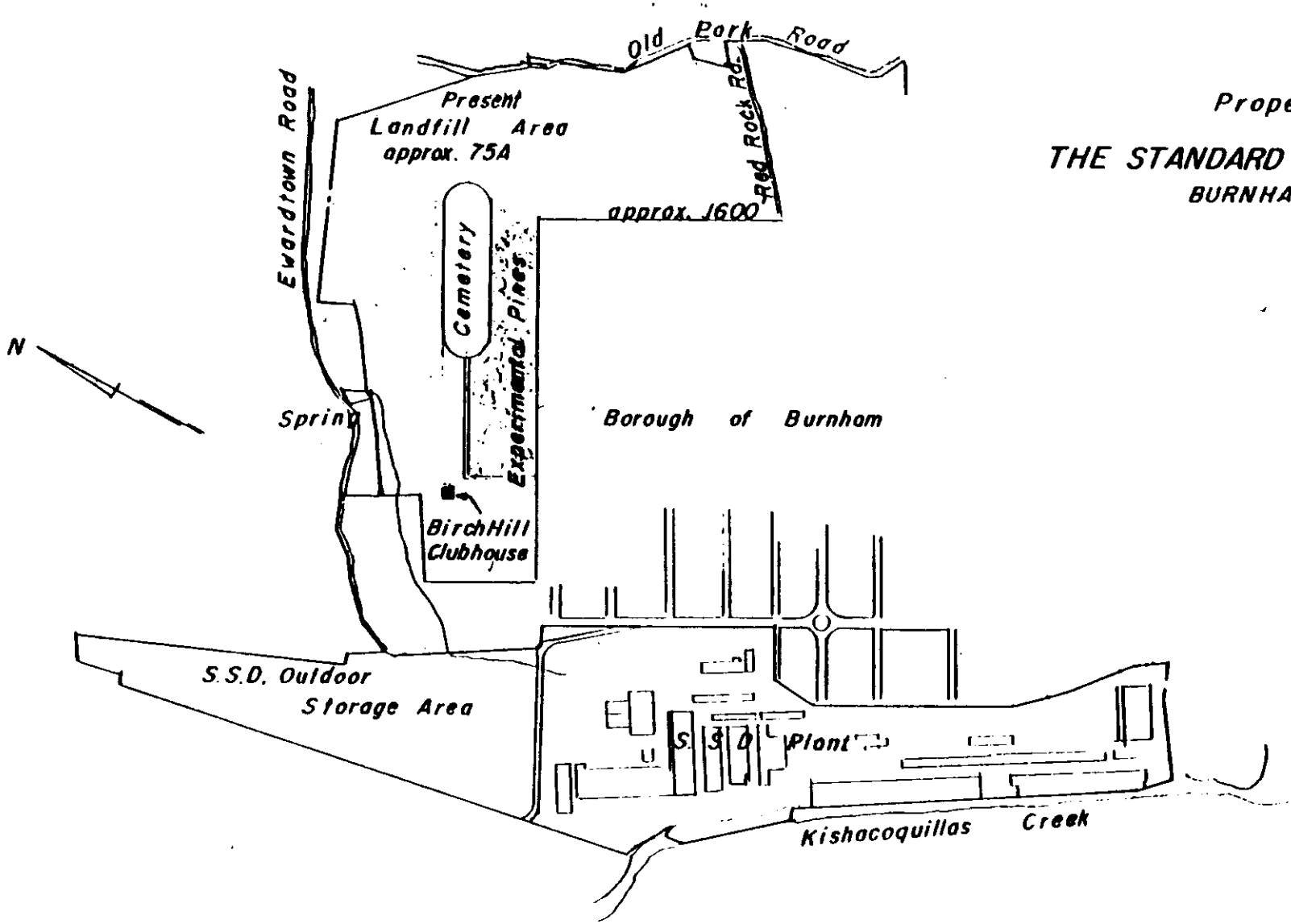
In view of the above facts, we respectfully request that you change our EPA status to "Generator".

Very truly yours,

J. E. Fogarty
President

nh
Enclosures

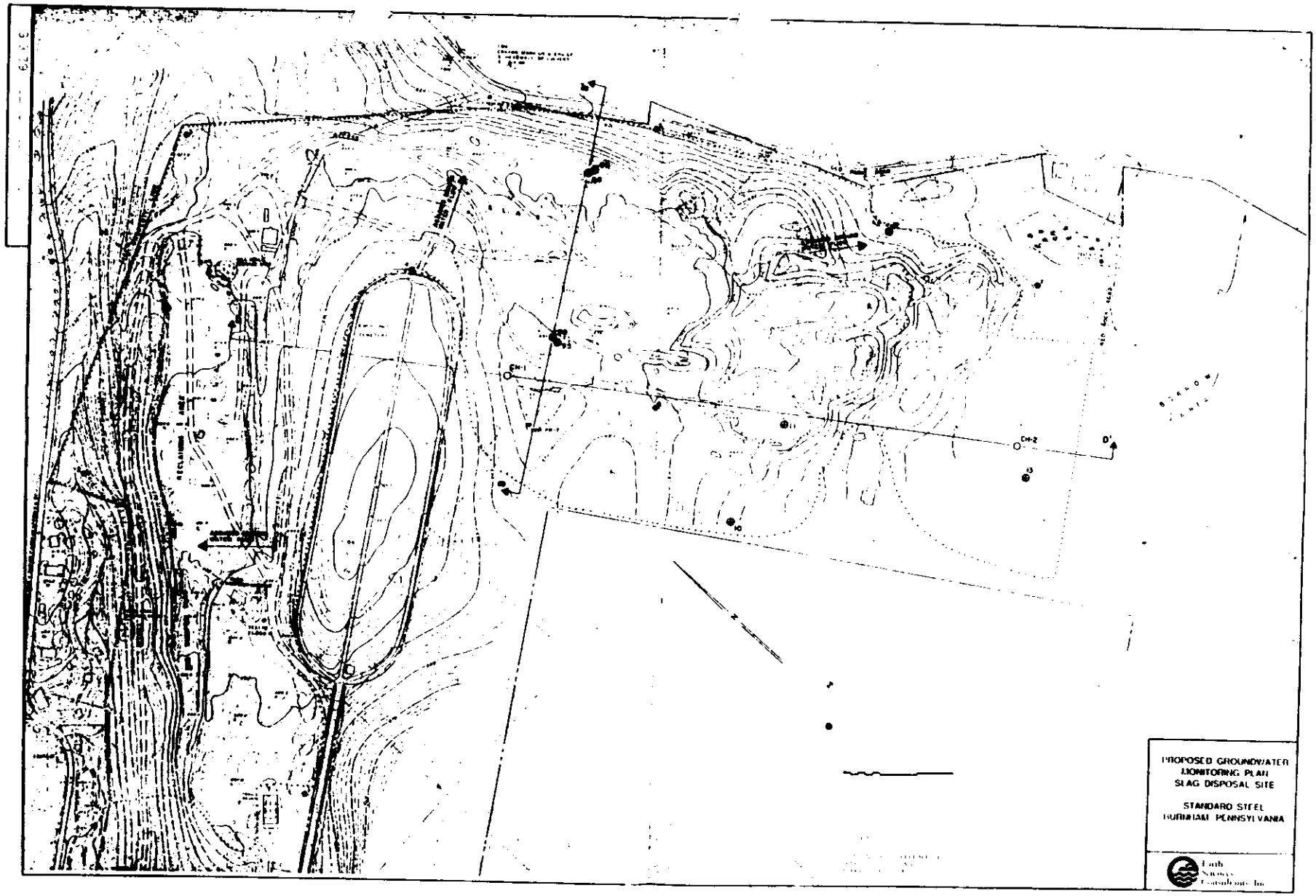
cc: Mr. Gary Galida, Harrisburg DER
Mr. Jeffrey Stout, Lewistown DER



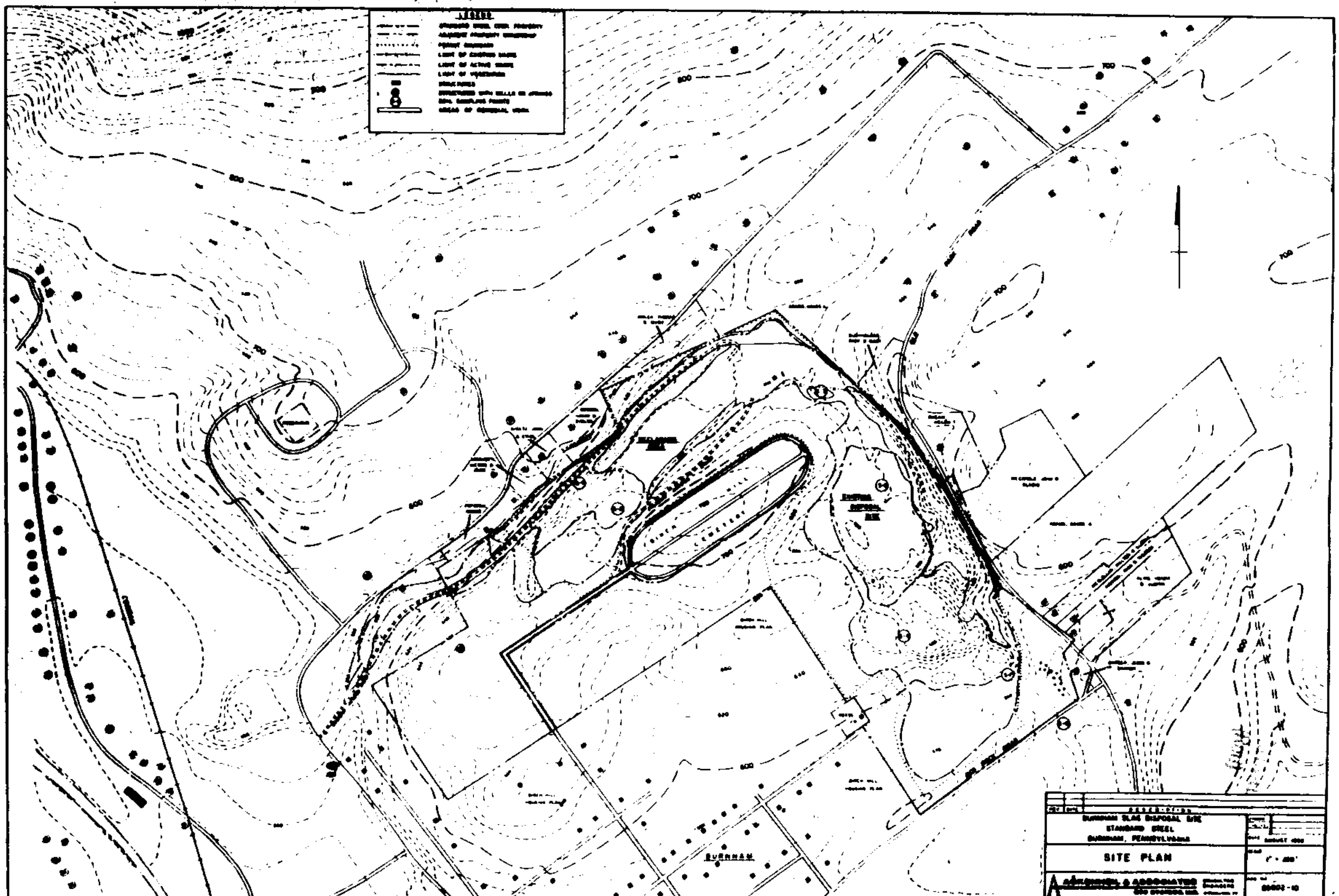
Property of

THE STANDARD STEEL WORKS

BURNHAM, PENNA.


PROPOSED GROUNDWATER
MONITORING PLAN
SLAG DISPOSAL SITE
STANDARD STEEL
BURNHAM PENNSYLVANIA
Earth
Science
Consultants Inc.

ORIGINAL


BURNHAM
SITE PLAN
OF-20803

The Way Ahead

The years have produced many changes in Burnham, some dramatic, some uneventful. Current employment at Standard stands at more than 2,000, and product lines divide between railroad products — wheels and axles — and a wide range of high-quality industrial rings and forgings. Annual production runs more than 250,000 tons and sales volume is approximately $140 million.

The plant represents much of the best in American industry — growth and progress to keep ahead of our nation's needs. The total change, spanning almost two centuries, is typified by the astounding transition from early wagon wheels to modern exotic metals and superalloys used in nuclear reactors, supersonic aircraft, rockets and missiles, and other remarkable applications.

STANDARD STEEL
Profiting through Performance since 1795

12

YEARS OF CHANGE AND PROGRESS AT STANDARD STEEL

Standard Steel is unique in the annals of American steelmaking and, for that matter, in American business. Its record of technology, production techniques and management philosophy, focuses attention on a company that began as a small forge in frontier wilderness, moved through 100 years of virtually total identification with the railroad industry, then emerged as one of the nation's foremost specialty steel mills. This is an amazing story of people, and the evolution in steelmaking they created and worked with in the hills of central Pennsylvania.

1

NDARD STEEL: RS OF CHANGE AND PROGRESS

tage Is Set

itney had just invented the cotton gin. Conestoga wagons were ng across the Appalachians to push westward expansion beyond io valley. Ohio itself would not achieve statehood for another ears.

Watt's steam engine designs were less than 30 years old, and Diesel would not be born for 60 years. The first American railroad ll 35 years away, the automobile 95, and the airplane more than 100.

ear was 1795

vo men established Freedom Forge, a small iron works in central lvania. That began years of continuous growth and expansion as alty mill. The years ahead brought modernization, innovation and logical advance to meet constantly changing demands in the ty steel markets.

at Burnham, Pa., Standard Steel - the direct descendant of m Forge — is a highly respected specialty producer, forging r products from high quality steels and superalloys.

e Ore and Dense Hardwood

ledgling days on the banks of the Kishacoquillas Creek 70 miles f Harrisburg, Freedom Forge smelted native ore from regional

2

deposits. The iron workers forged bars, rods and sheets for shipment via river barge and wagon to blacksmiths, wagon makers and shipwrights. The stock became axes, cooking utensils, wagon tires and ship fittings.

Methods were crude, but the Juniata Valley held rich potential for an emerging American iron and steel industry, with plentiful supplies of iron ore and dense hardwood forests. Moreover, the Juniata and Susquehanna Rivers offered ready access to expanding markets, and the Kishacoquillas supplied the water power demanded by forges of the day.

CANAL AND RAIL: New Roads to Market

During the second quarter of the 19th century, two special events significantly influenced Freedom Forge. In 1829 the Pennsylvania Canal, creeping westward, reached Lewistown, only three miles from the forge. Twenty years later, the tracks of the Pennsylvania Railroad reached Lewistown from the east, opening wider the area's access to eastern markets. In less than three years the railroad extended westward to Pittsburgh.

STANDARD "INVENTS" THE WHEEL

Pioneering Railroad Tire and Wheel

The company was reorganized in 1856 as Freedom Iron Company, one of Pennsylvania's largest forges, with eight fires and five steam hammers, producing 930 tons of blooms and 380 tons of bars per year. More important, Freedom Iron opened the first wrought iron railroad tire mill in the United States that same year.

Until then, all railroad tires were imported, primarily from England. The new mill had a double impact: it tied the company to the burgeoning railroad industry and irrevocably identified the forge as a specialty mill oriented toward annular products.

In its first year the mill produced more than 2,000 tires. Freedom workers made tires by piling blooms, heating them, and forging them into bars with rectangular cross-sections. They fed the forged stock through a swedging die until the flange was roughly formed, then reheated each bar, rounded it, scarfed it, welded the ring, and rolled it into a tire.

From that time on, Freedom Iron and its successor, Standard Steel, have been identified with the railroad wheel. And the tire mill prospered through the Civil War.

3

American Steel Tires Eliminate Imports

Standard's skill in producing steel tires began to influence imports, until then the major source of railroad components. In 1888, the American agent for Krupp, then the world's largest steelmaker, warned the German industrial giant that foreign steel companies were losing the American market.

The agent quoted his customers as saying that they couldn't see paying extra for Crucible Tires when they were getting nearly as good results from American Martin tires, produced by Standard and Midvale. He said that if he came into the market with a good order, he could get Martin steel tires for half the price of Krupp Crucible Steel Tires.

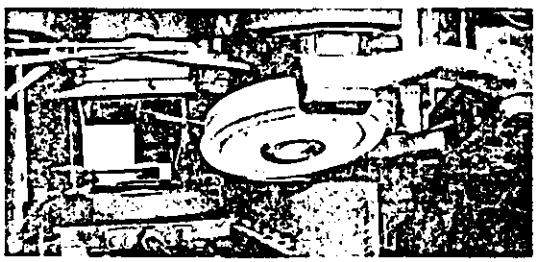
It's precisely what happened; Krupp blazed its way as an arms and munitions maker, and Standard cut deeply into the railroad market.

By 1892 Standard was producing built-up steel tires for engine trucks, coaches and tenders. The original built-up tires had wrought or cast iron centers, but Standard soon changed to cast steel centers.

STANDARD WHEEL: Industry's Standard

As railroads continued to criss-cross the country, they demanded more sophisticated operating equipment, capable of carrying greater loads at higher speeds. Chilled cast iron wheels became inadequate for heavy rail service.

Standard responded in 1904 with another first: the first solid forged and rolled steel wheel in the United States. Seven years later, Freedom Forge's descendant unveiled the rolled steel center for bolted-type tires in filling a special order for Pullman car wheels.



But problems continued to develop. Western railroads found that wheels cracked under combined stresses of steep mountain grades, sharp curves, and increased train speeds and loads. Then in 1[illegible] Standard proved that slow cooling to ambient temperatures eliminated the internal defects causing fractures under such stress, and the process is still used today.

FREEDOM WHEEL: First Heat-Treated Wheel

From the Depression came the company's famous Freedom Wheel, named for Standard's ancestor, Freedom Forge. Invented in 1930, it was the industry's first heat-treated wheel. Although obtaining an exclusive patent on the wheel in 1937, Standard offered the process to competitors without compensation, and to this day, no royalties have been collected.

Extensive wheel mill modernization programs have helped the company maintain its position as one of six major wheel suppliers in the United States. During the 1950's the company invested more than $1 million in wheel line improvements involving several major machines. The largest is a Kearney & Trecker five-machine automated transfer line, capable of boring, facing and turning a finished wheel every 75 seconds. Snyder face-and-turn mills later augmented the Kearney & Trecker line.

Steel-Aluminum Rapid Transit Wheels

Standard took a major step as a wheel producer when it received contracts for steel-tired, aluminum-centered rapid transit wheels. In 1968 the company assembled such wheels for 150 transit cars which the Budd Company delivered to the Chicago Transit Authority. The wheels weighed 200 pounds less than comparable steel wheels, yet matched steel wheel performance. The 1,600-pound weight reduction per car reduced propulsion power needs and cut operating cost.

Shortly after that, Standard received contracts for 2,000 steel-aluminum wheels for the San Francisco Bay Area Rapid Transit System, and Acoustaflex sound suppressive wheels for Boston's and San Francisco's new, light rail vehicles.

Nuclear Forgings And Jet Engine Rings

Standard began supplying stainless steel and superalloys in the 1950's, producing rings for nuclear submarines and nuclear power plants. The plant forged or cast gear blanks, hydroelectric pump castings, stay rings and runners, piping, oil drilling parts, crusher and power shovel

components, superalloy rings for jet engines and missiles, and high-alloy forgings for steam catapults on aircraft carriers.

Superalloys became increasingly important, as new applications demanded steel and nickel-base alloys that could stand the extremes from high engine heats to outerspace cryogenic temperatures. Greater strength and improved wear resistance under extreme conditions became commonplace.

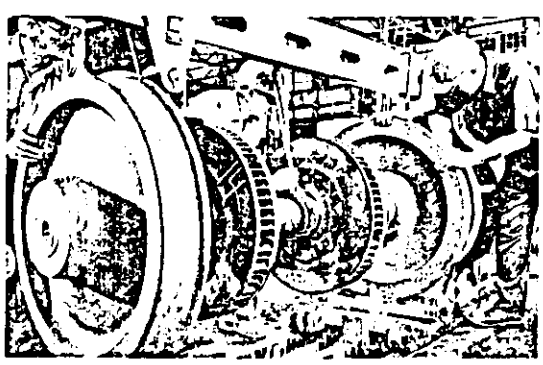
The mill also pursued more mundane orders for special steels. Oversized oil drills for Arabia, for example. Oil explorations in the Middle East had proven the need for special-duty drills, capable of piercing the unusual geologic stratification in the area.

EVOLUTION EXPANSION

Standard and its predecessors consistently paralleled and, in many instances, led in technological innovations. The first American tire mill has already been mentioned.

First Wellman Furnace

The company installed a Wellman acid open-hearth furnace in 1895 — the first in the United States. The 15-ton furnace was served by an electrically driven charging machine — another first in American steelmaking. The furnace poured its first heat in 1895, almost 100 years to the day from Freedom Forge's first pour.



Demands for steel castings caused Standard to establish a steel foundry in 1897 with two 15-ton open-hearth furnaces. A year later, the company built a new forge shop to accommodate increasing railroad orders. By 1920 the steel mill had added four more open-hearth furnaces, ranging from 50 to 65 tons, plus a spring shop and two large foundries. The latter produced tire centers, a variety of malleable iron products and ingot molds for Standard's own use. The plant was fast becoming a fully integrated steel mill.

Science Versus Intuition

The company built its first heat-treating plant in 1910, then doubled it by 1917.

"Seat of the pants" methods were being replaced by technology. "Eyeball" metallurgy was nearing an end, because accurate pyrometers told master steelmen when a charge had reached proper heat.

Standard metallurgists before and during the 1920's were studying vanadium, nickel, manganese, chromium and molybdenum as steel additives. In short order, the special steels were issuing from the furnaces and forges.

Research continued through the Depression, when plant changes were naturally minimal, but World War II forced massive changes in production equipment. Shortly after the war, the furnaces and mills were converted from pulverized coal to oil. The research laboratory doubled in size, and the first electric furnace was installed.

POLLUTION CONTROL: Progression of Changes

Standard installed a mechanical fly ash collector in 1953 that was one of the first of many steps in decades of major air-pollution efforts. Heating furnaces were converted to natural gas and, in 1957 a 15-ton vacuum arc remelt furnace was installed. Two more electric furnaces were added during the 1960's and a fourth was in operation in 1971. The last open hearth shut down when the fourth electric furnace began pouring, and in the late 1950's foundry operations began to phase out.

The cumulative impact of the many changes — from foundry closing and conversions to electric furnaces and natural gas, to automated processes and new metallurgical techniques — made Standard a model for the gratifying effects of pollution control in the steel industry.

$40 Million Expansion Program

During the mid 1950's Standard embarked on major expansions that have continued without letup. For two decades, the company has

committed more than $3 million per year to improvements that range throughout the various mills, labs and facilities.

New equipment and processes encompass ultrasonic immersion testing for sonic flaw detection, vertical heat-treating furnace, extensive macroetch testing, spectrographic analysis equipment, and a new metallurgy laboratory. Many heat-treating furnaces were replaced, and new conveyors and handling equipment helped speed the flow of materials, work in progress and finished products.

Standard installed a vacuum stream degassing system in 1958, making the plant the fourth steel mill in the United States that could produce vacuum degassed electric steel. The company was also the nation's first integrated supplier of vacuum arc remelted superalloy rings and special closed-die forgings for high-stress high-temperature applications, and was a leader in developing maraging steels.

Complete conversion of the ring mill and final phase-out of foundry operations in 1964-65 mandated a massive retraining program to retain employees on the rolls. The transition for many was drastic. Steel workers with 30 years background in basic ring rolling techniques were retrained to operate intricate consoles governing automated processes. But the transition was accomplished.

With the new ring mill, the plant could process steel from a billet to a ring with a single heat. Ring production capacity tripled.

An IBM 370 computer now speeds complex cost estimating on rings and shafts, taking into account such divergent factors as steel grade, shape, size, testing, heat treating, machining, finishing and delivery requirements. The computer also handles accounting data, payroll records, and production and inventory control. Standard applies the computer to control steel mixes, schedule machine loads, and analyze maintenance and downtime problems.

Automated Forging and Machining

A most significant phase in the modernization program occurred in 1969 with the installation of the $6 million AFM forging and machining facility to produce axles, shafts and bar stock. The AFM is housed in the stone building erected in 1867 to accommodate the ill-fated Bessemer equipment. Extensively modified, the building offers a unique blend of the old and new.

The AFM includes a walking beam bloom-heating furnace, automated material handling equipment, three heat-treating furnaces and a programmed forging machine capable of producing axles or shafting in less than four minutes, with tolerances as close as 1/32 inch. Batch-type furnaces were added and the axle/shaft machine shop was completely relocated and reorganized to permit semi-automatic work flow.

Energy

Although Standard Steel has always been conscious of the cost and availability of fuels, a concerted effort began in 1972 to conserve energy more than ever before. At the time, natural gas was the primary fuel in the heating and treating of steels. By mid-1975 practically all furnaces had been converted to multiple-fuel capability, for natural gas, fuel oil and propane gas.

Wherever possible, modern insulating materials retarded heat loss. Exhaust steam is being used to preheat boiler feed water and the first package boiler, using furnace exhaust heat to generate processing steam, was installed in 1976.

All energy-consuming facilities receive periodic checks to assure the most efficient operation possible. It's also significant that between 1968 and 1975, total tonnage melted increased by 27% — yet during the same period, consumption of energy in all forms *decreased* by almost 18%!

As new commodities and equipment — that hold any promise of energy conservation — are introduced on the market, trials and studies are run to determine their value for Standard Steel.

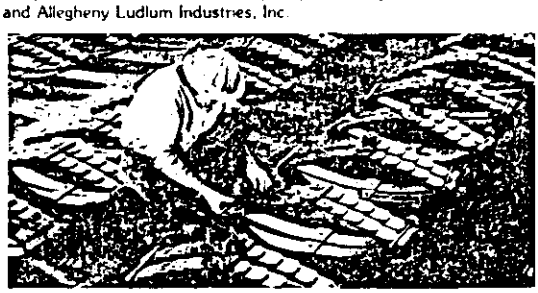
Merger Moves

The acquisition and merger trend of the 60's and early 70's had a profound effect on Standard Steel. In 1965, Baldwin Lima Hamilton Corporation and Armour and Company entered into an agreement of merger, to transfer the entire business and all assets of BLH to Armour.

Promptly after the merger, all assets were transferred by Armour to a newly formed, wholly owned subsidiary corporation having as part of its name the words, Baldwin-Lima-Hamilton. The subsidiary assumed the business operations of BLH and continued under substantially the same management.

In 1970, Greyhound Corporation acquired Armour, which encompassed all of BLH, of which Standard Steel was a large part.

Then in 1972, Standard Steel was purchased by Titanium Metals Corporation of America, which is jointly owned by NL Industries, Inc. and Allegheny Ludlum Industries, Inc.



Latrobe Complements Burnham

Standard was given the responsibility for operating a facility in Latrobe, Pa., in 1976, which included a group of talented engineers, technicians and quality control specialists. This plant was the Latrobe Forge and Spring Co., acquired by Titanium Metals Corporation of America. It offers custom metal forming and the manufacture of heavy duty springs for a variety of applications, with a highly skilled team to work on custom design and production assignments for railroad equipment, mining machinery, ships and rolling mills. The Latrobe plant developed components for the Saturn launch vehicle and supplied important parts for the Navy nuclear program, and is equipped to shear, punch, taper, hot or cold form, stamp finish and test products of sheet, plate or bar stock, as well as journal box lids and wear plates. It is also equipped for the production of open die forgings and rings.

RECENT CAPABILITIES EXPANSION

Ring Mill

A huge new ring mill rolling complex commenced operation early in 1977. The mill and its accompanying press facility are designed to produce 100 tons per turn. Representing an investment of $10 million, and the most modern ring-making facility in the world, the installation is capable of producing the full range of ring products that will keep Standard competitive in today's market.

Bottom Pour

Starting in February, 1977, the new patented Bottom Pour Ingot process began producing steel for all railroad wheels. Steel is teemed through a center trumpet, flows along runner brick and elbows into the bottom of eight cylindrical molds. This ingot casting process along with special proprietary techniques controls casting rate and assures crack-free surfaces. The ingots produced from this process are free of columnar grains exhibited by conventional corrugated or fluted ingots, and the wheel blocks cut from the cylindrical ingots are superior in grain structure, homogeneity and cleanliness. Extensive testing and evaluation programs have verified excellent wheel quality. This steel will be used exclusively for all products as time goes on.